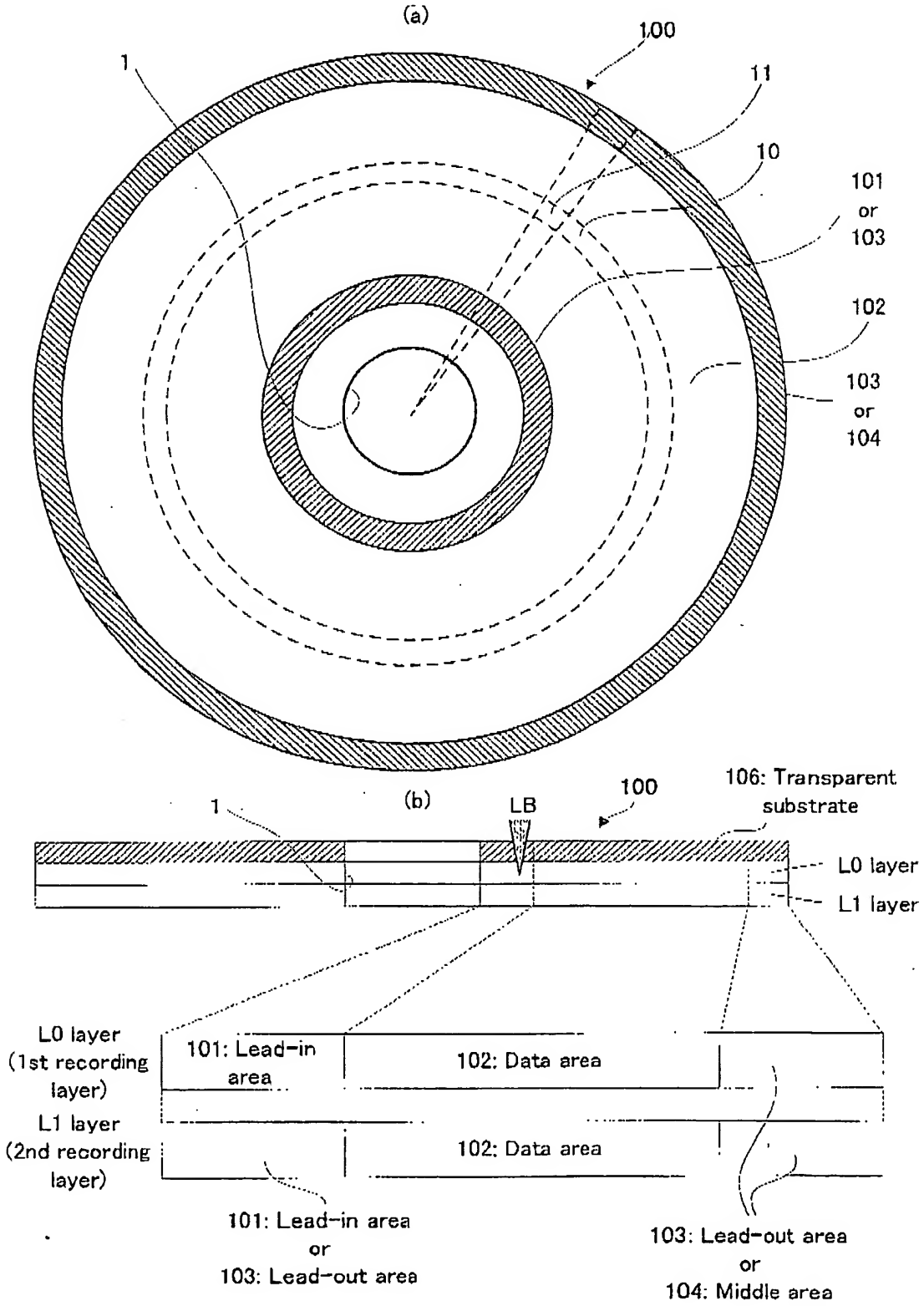
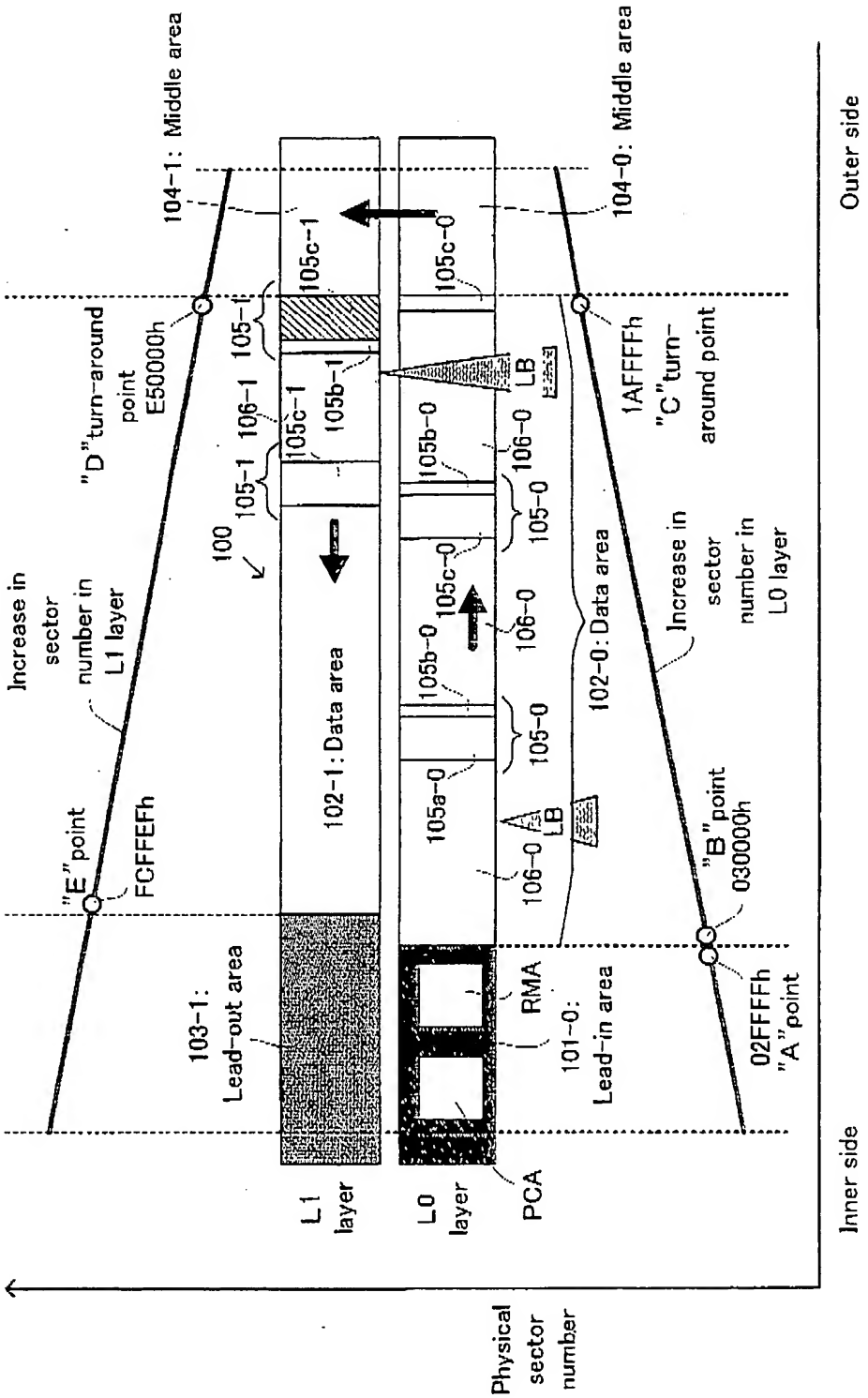
[FIG. 1]


(a)
100
1
11
10
101
or
103
102
103
or
104
(b)
100
106: Transparent substrate
1
LB
L0 layer
L1 layer
L0 layer
(1st recording layer)
101: Lead-in area
102: Data area
L1 layer
(2nd recording layer)
102: Data area
101: Lead-in area
or
103: Lead-out area
103: Lead-out area
or
104: Middle area

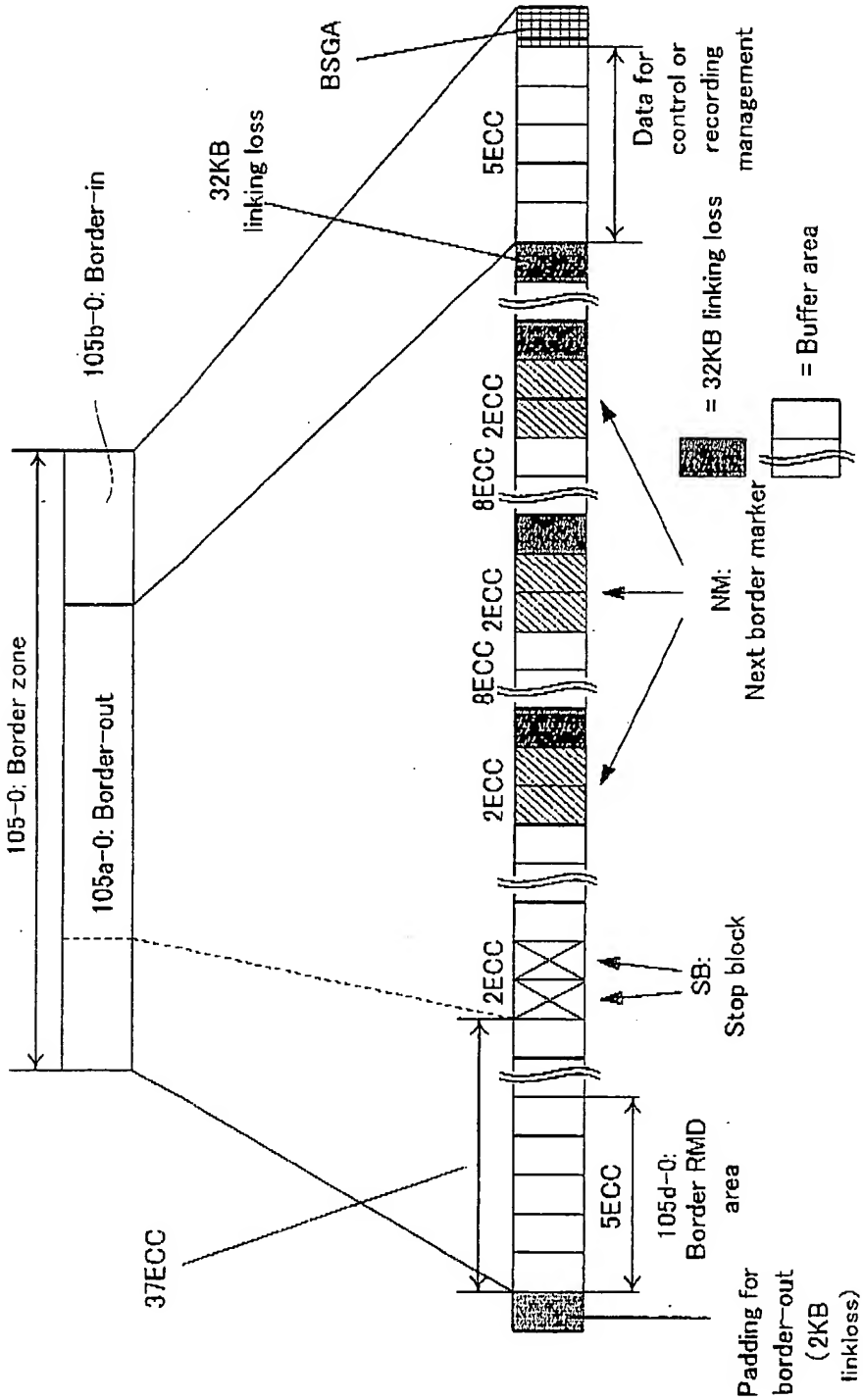
[FIG. 2]


104-1: Middle area
104-0: Middle area
Outer side
"D" turn-around point
E50000h
1AFFFFh
"C" turn-around point
Increase in sector number in L1 layer
Increase in sector number in L0 layer
100
105-1
106-1
105c-1
105b-1
105a-1
105c-0
105b-0
105a-0
106-0
105-0
LB
"E" point
FCFFEFh
102-1: Data area
102-0: Data area
"B" point
030000h
103-1: Lead-out area
RMA
101-0: Lead-in area
02FFFFh
"A" point
L1 layer
L0 layer
PCA
Inner side
Physical sector number

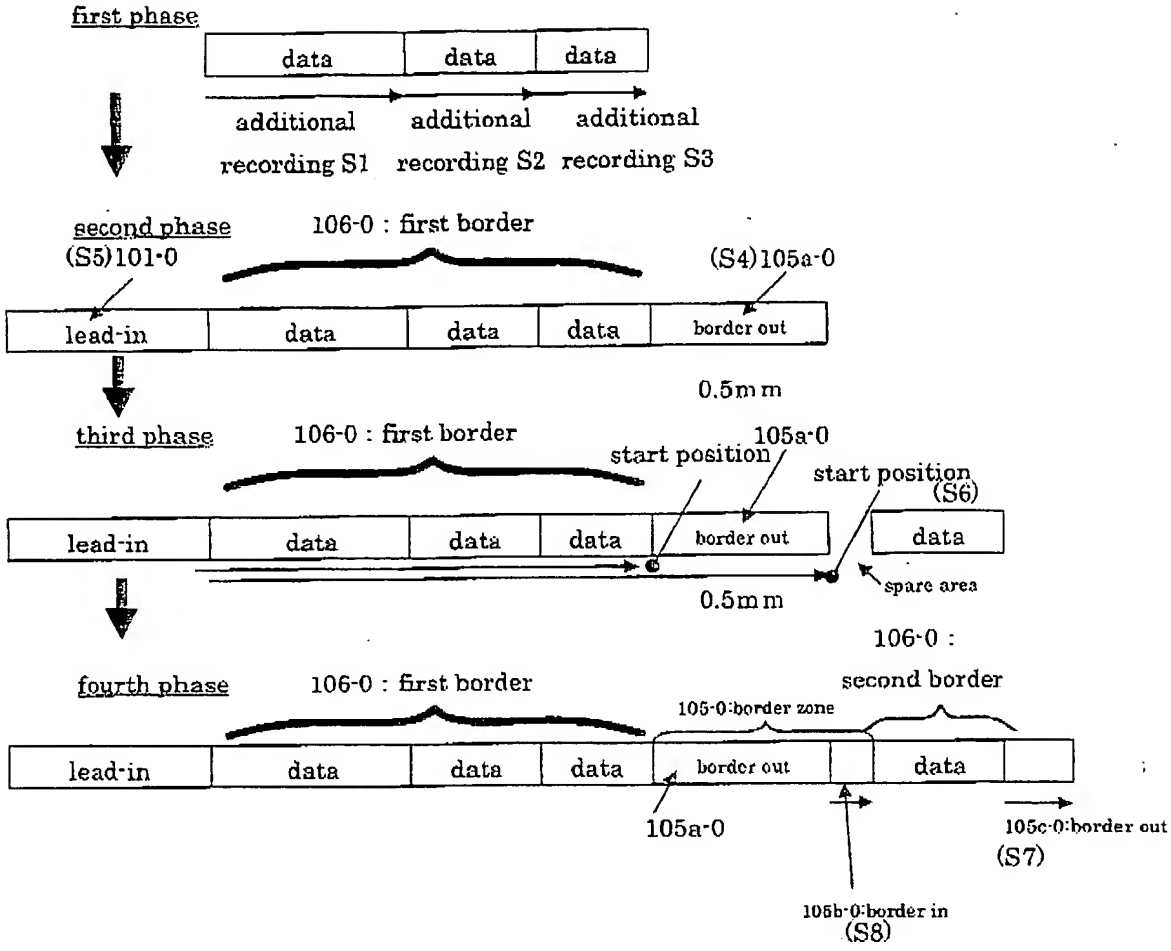
[FIG. 3]

| Sector number of start position of border zone | 3FF00h～B25FFh (inner) | B2600h～1656FFh (middle) | 165700h～ (outer) |
|---|---|---|---|
| First border zone | 1792 ECC 56MBytes | 2368 ECC 74MB | 2944 ECC 92MB |
| Second or subsequent border zone | 384ECC 12MB | 480 ECC 15MB | 608 ECC 19MB |

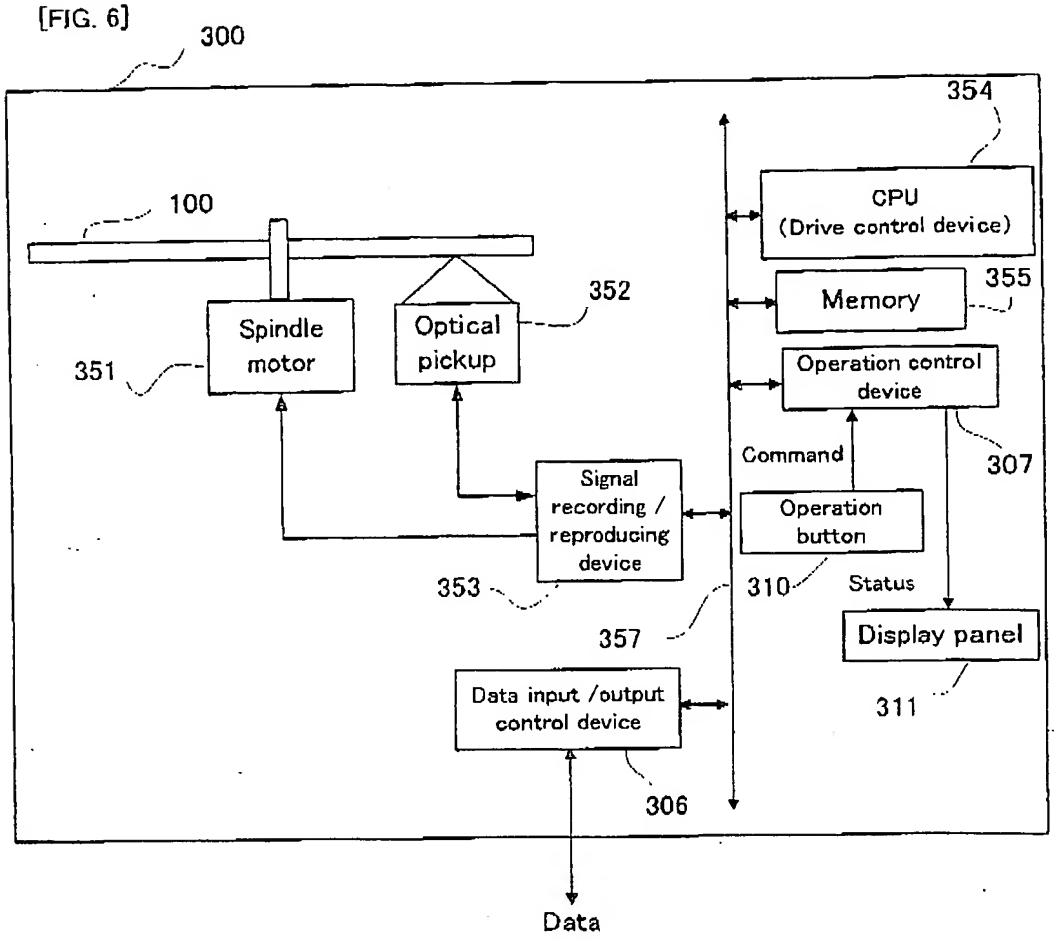
[FIG. 4]


105-0: Border zone
105b-0: Border-in
105a-0: Border-out
32KB linking loss
BSGA
5ECC
Data for control or recording management
8ECC 2ECC
8ECC 2ECC
2ECC
2ECC
NM: Next border marker
= 32KB linking loss
= Buffer area
SB: Stop block
37ECC
5ECC
105d-0: Border RMD area
Padding for border-out (2KB linkloss)

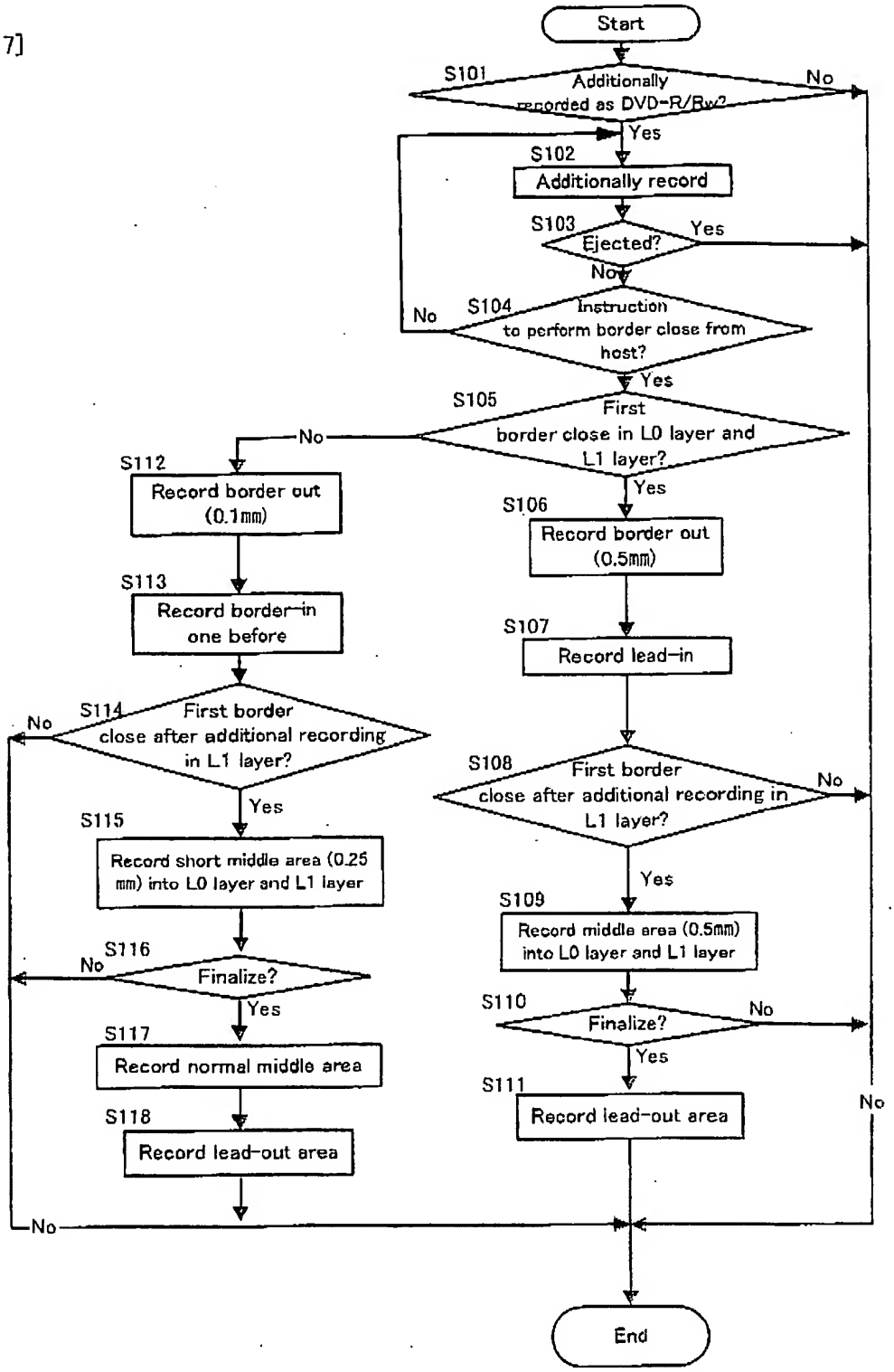
[FIG.5]


first phase
data
data
data
additional recording S1
additional recording S2
additional recording S3
second phase
(S5)101-0
106-0 : first border
(S4)105a-0
lead-in
data
data
data
border out
0.5mm
third phase
106-0 : first border
105a-0
start position
start position
(S6)
lead-in
data
data
data
border out
data
spare area
0.5mm
106-0 :
second border
fourth phase
106-0 : first border
105-0:border zone
lead-in
data
data
data
border out
data
105a-0
105c-0:border out
(S7)
105b-0:border in
(S8)

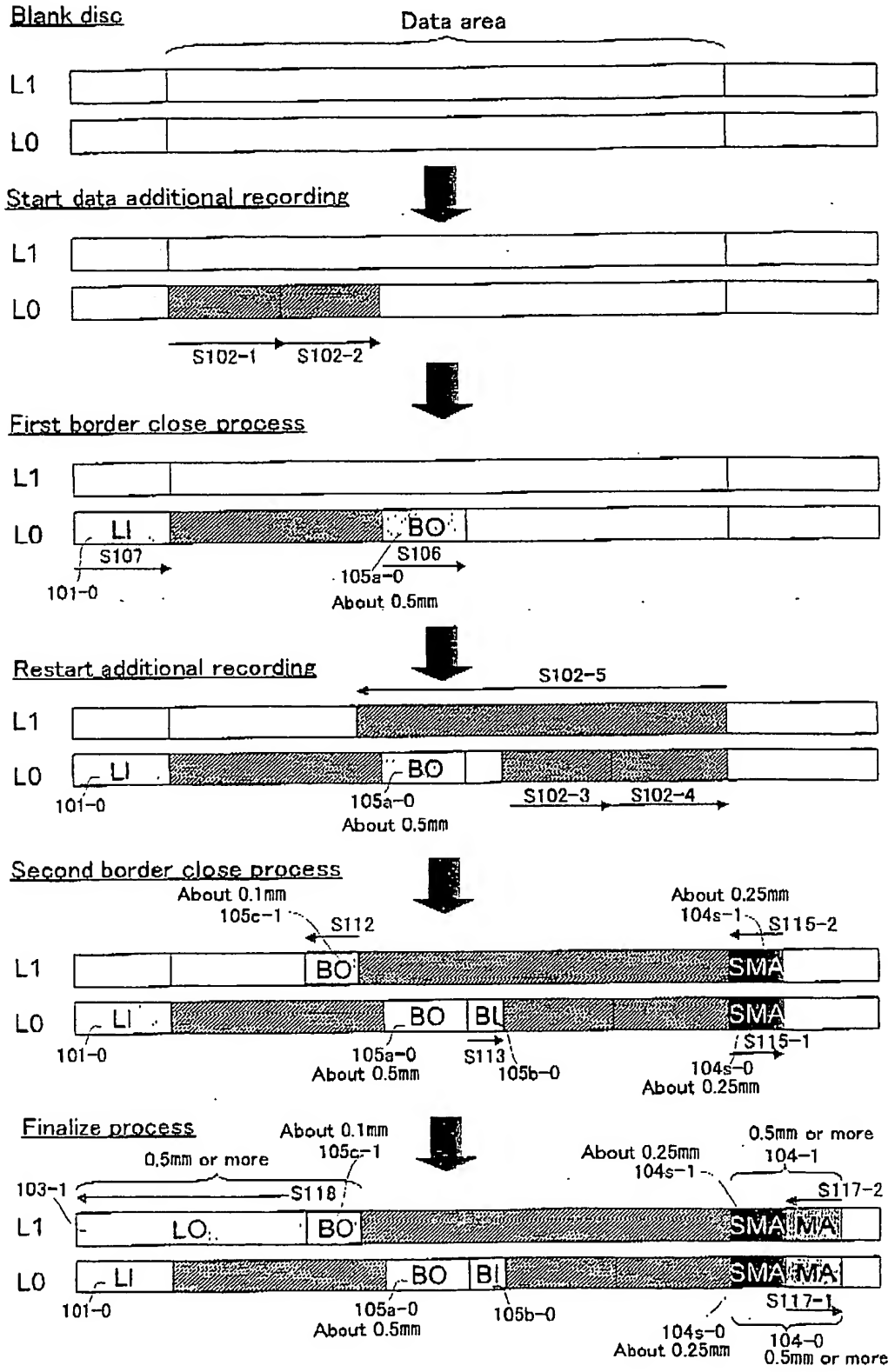
[FIG. 6]


300
354
CPU
(Drive control device)
100
Memory
355
352
Spindle motor
Optical pickup
351
Operation control device
307
Command
Signal recording / reproducing device
Operation button
353
310
Status
357
Display panel
311
Data input /output control device
306
Data

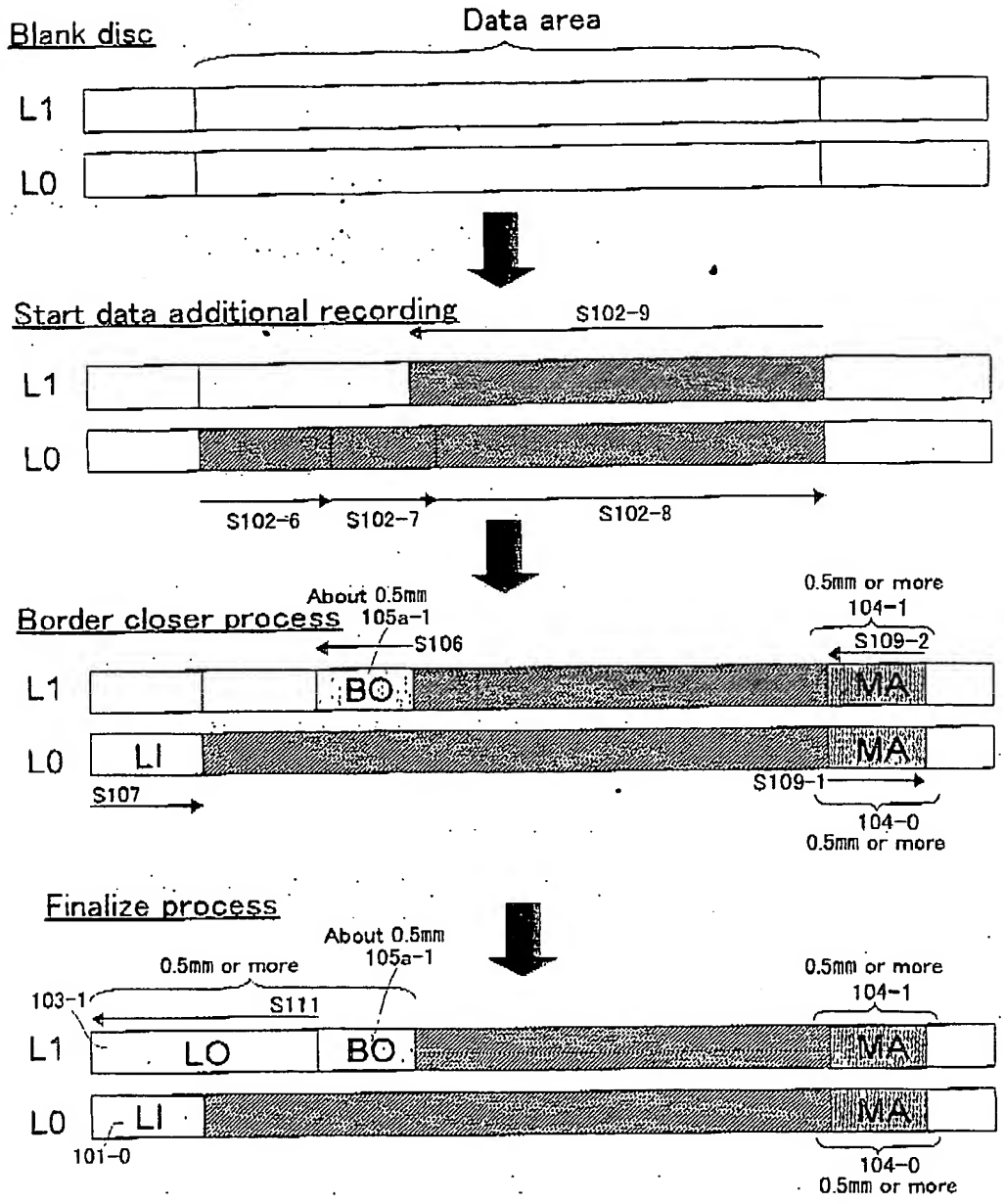
[FIG. 7]


Start
S101
Additionally recorded as DVD-R/Rw?
No
Yes
S102
Additionally record
S103
Ejected?
Yes
No
S104
Instruction to perform border close from host?
No
Yes
S105
First border close in L0 layer and L1 layer?
No
Yes
S112
Record border out (0.1mm)
S113
Record border-in one before
S114
First border close after additional recording in L1 layer?
No
Yes
S115
Record short middle area (0.25 mm) into L0 layer and L1 layer
S116
Finalize?
No
Yes
S117
Record normal middle area
S118
Record lead-out area
S106
Record border out (0.5mm)
S107
Record lead-in
S108
First border close after additional recording in L1 layer?
No
Yes
S109
Record middle area (0.5mm) into L0 layer and L1 layer
S110
Finalize?
No
Yes
S111
Record lead-out area
No
End

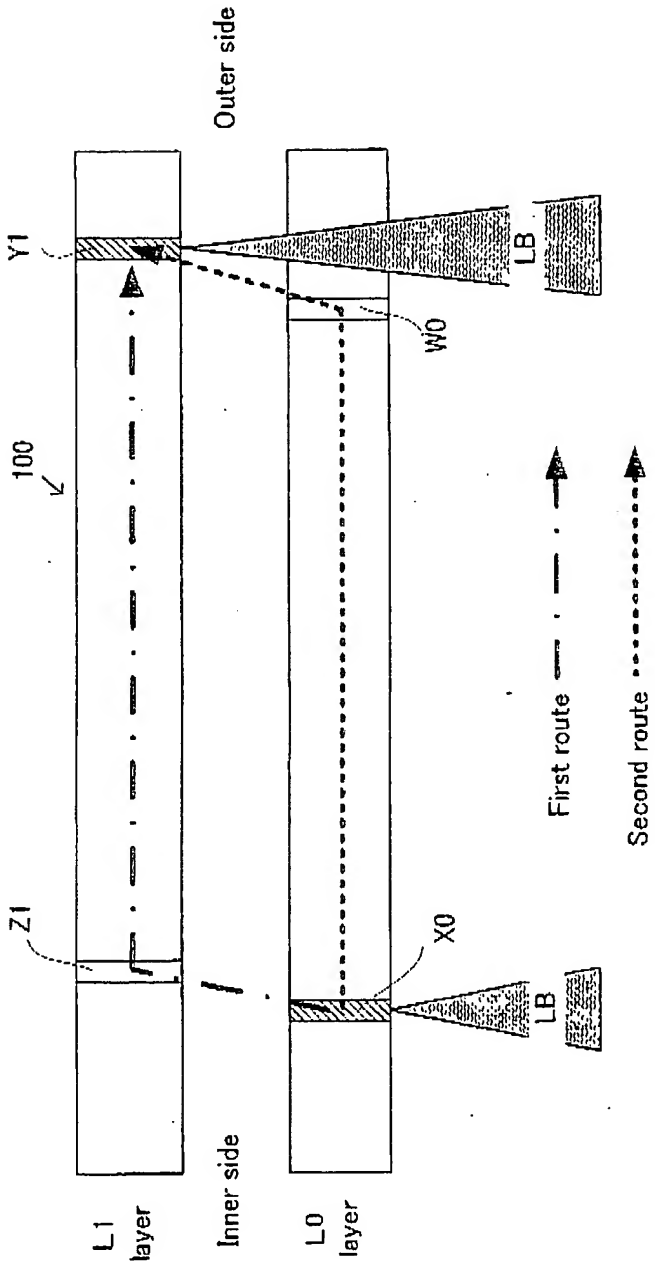
[FIG. 8]


Blank disc
Data area
L1
L0
Start data additional recording
S102-1
S102-2
First border close process
LI
BO
S107
S106
101-0
105a-0
About 0.5mm
Restart additional recording
S102-5
S102-3
S102-4
Second border close process
About 0.1mm
105c-1
S112
About 0.25mm
104s-1
S115-2
SMA
BI
S113
105b-0
S115-1
104s-0
About 0.25mm
Finalize process
0.5mm or more
103-1
S118
104-1
S117-2
LO
MA
S117-1
104-0

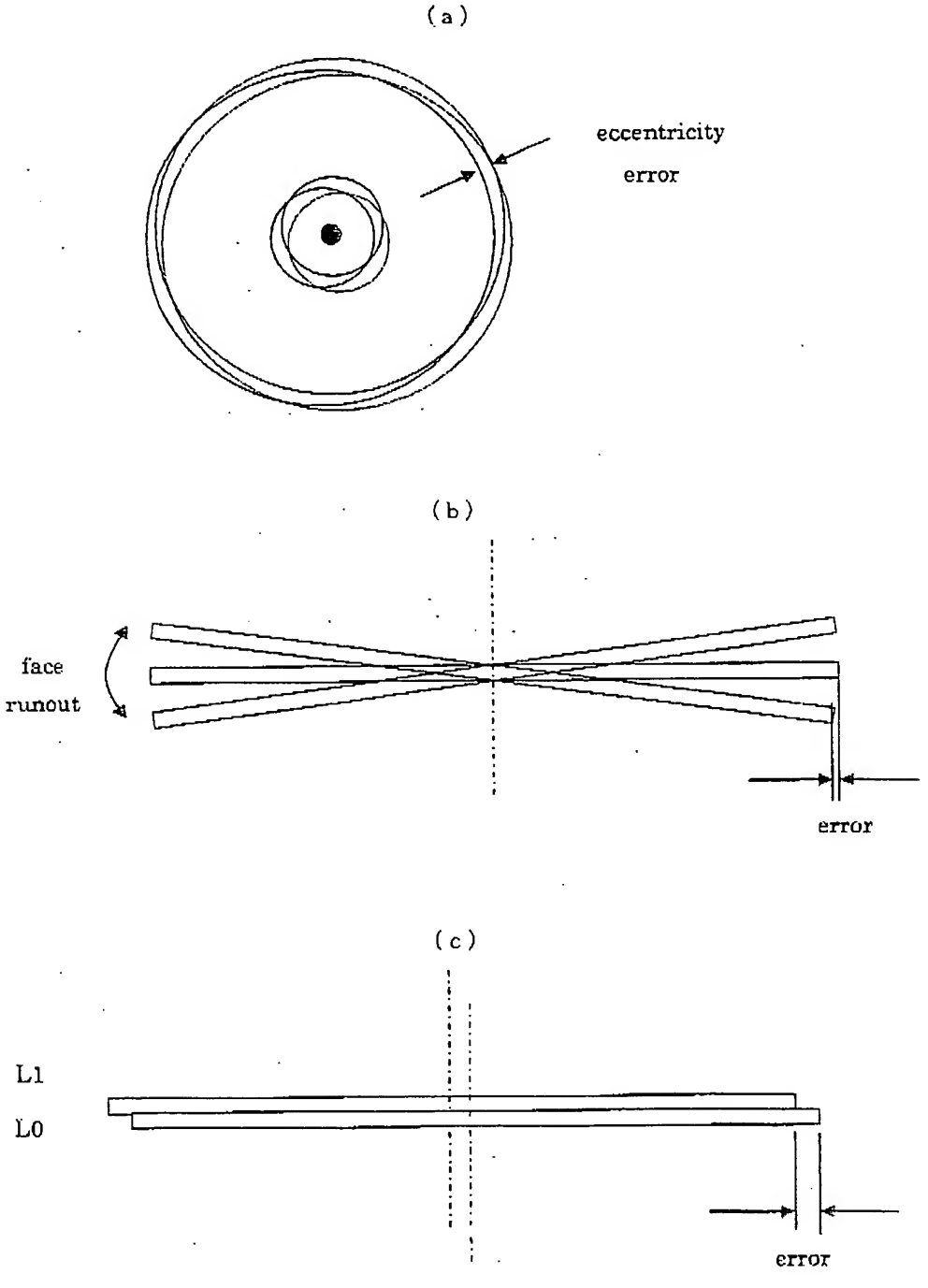
[FIG. 9]


Blank disc
Data area
L1
L0
Start data additional recording
S102-9
L1
L0
S102-6
S102-7
S102-8
Border closer process
About 0.5mm
105a-1
S106
0.5mm or more
104-1
S109-2
L1
BO
MA
L0
LI
MA
S107
S109-1
104-0
0.5mm or more
Finalize process
About 0.5mm
105a-1
0.5mm or more
S111
103-1
0.5mm or more
104-1
L1
LO
BO
MA
L0
LI
MA
101-0
104-0
0.5mm or more

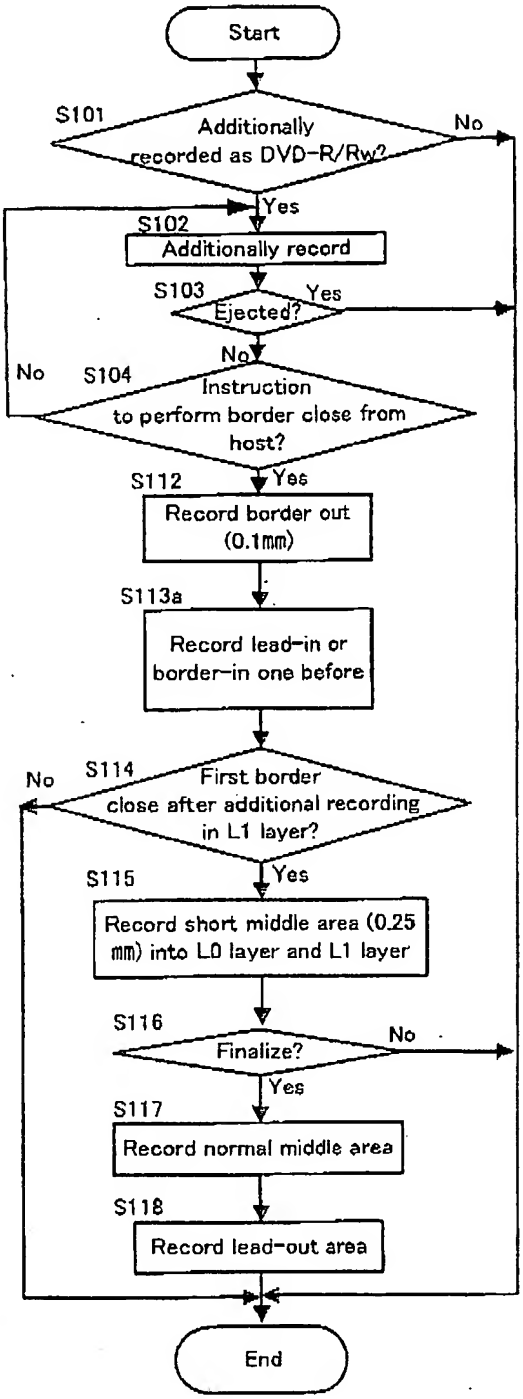
[FIG. 10]


Outer side
Y1
LB
W0
100
First route
Second route
Z1
X0
LB
L1 layer
Inner side
L0 layer

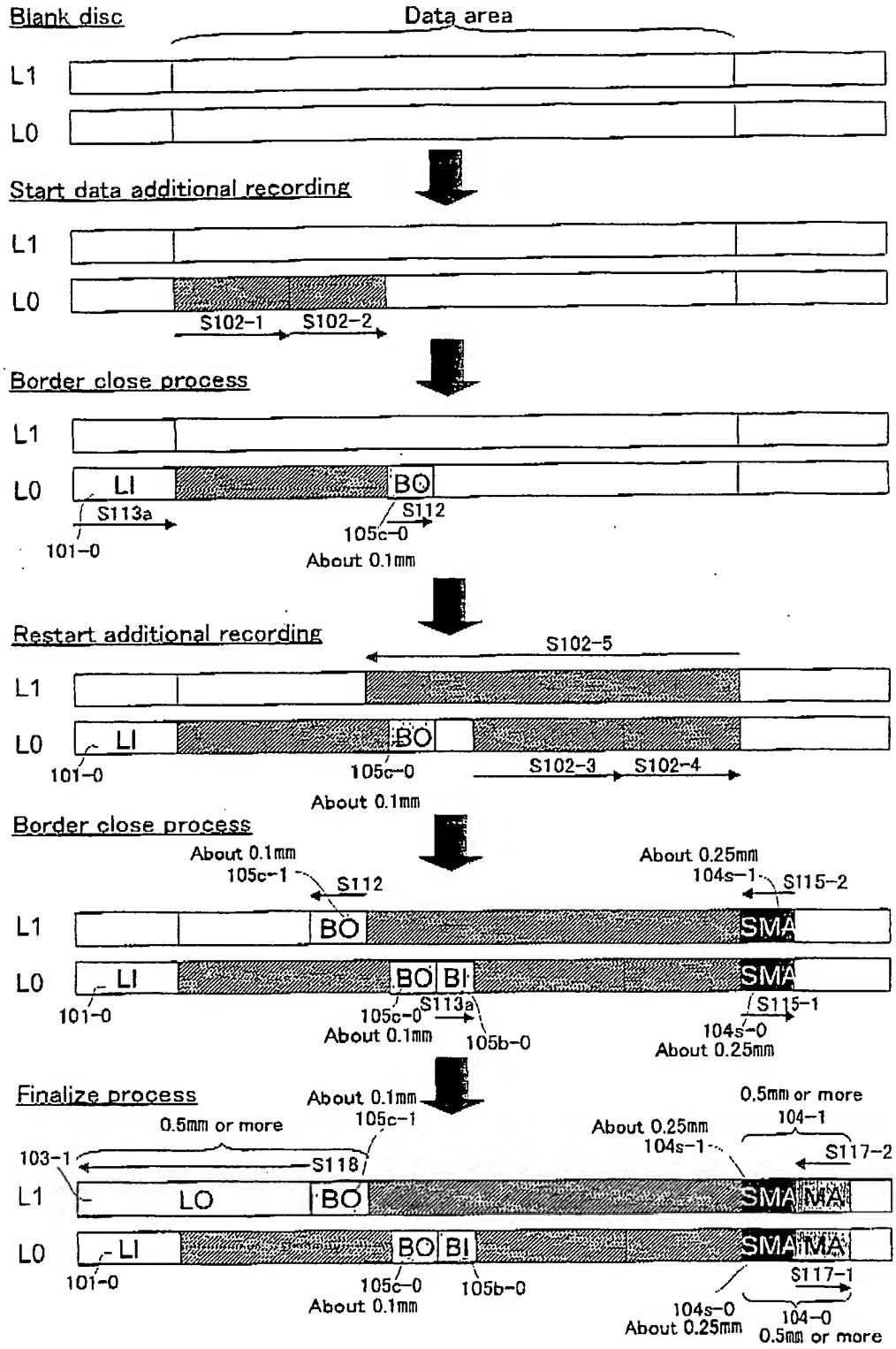
[FIG. 11]



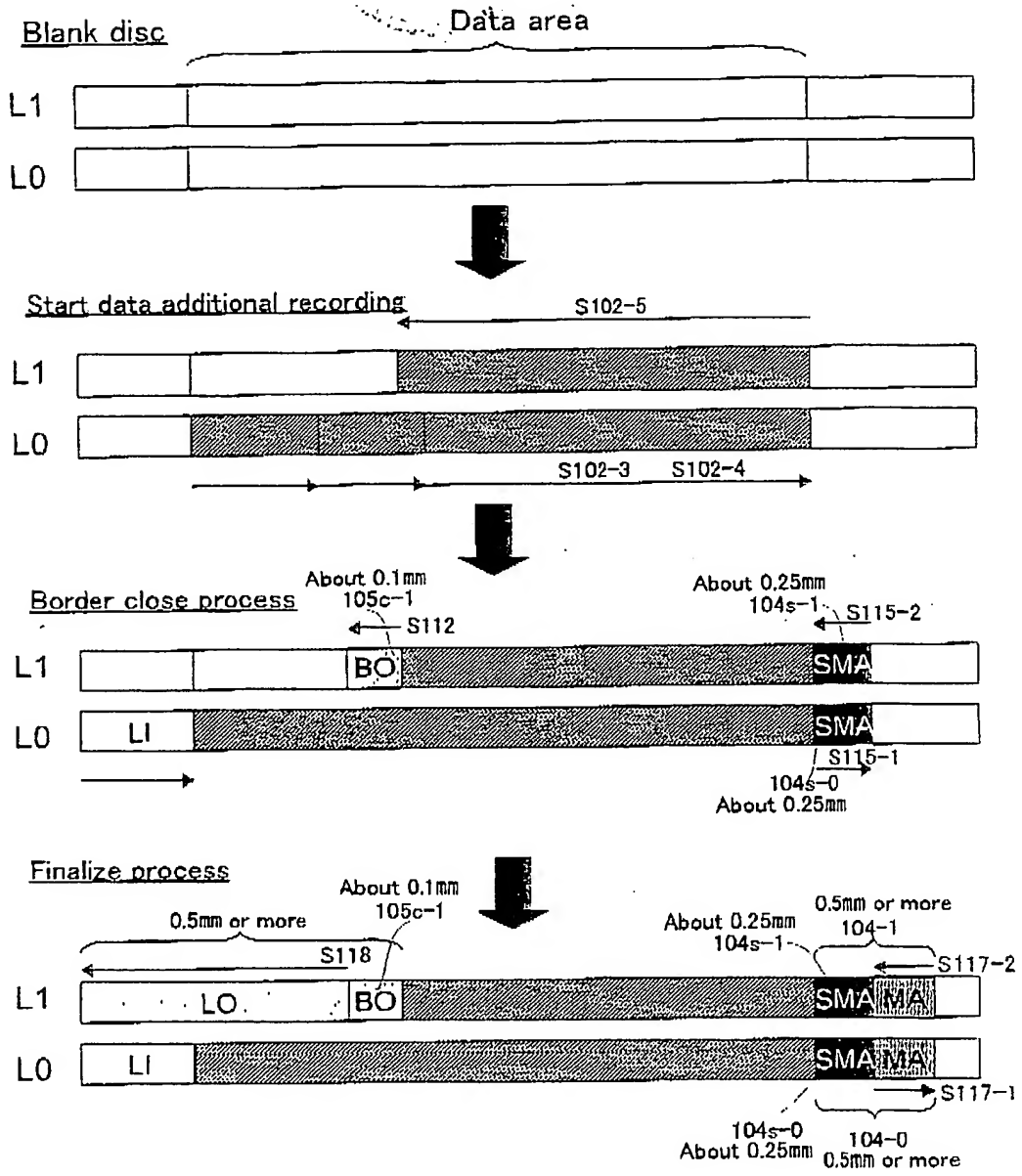
[FIG. 12]


Start
S101
Additionally recorded as DVD-R/Rw?
No
Yes
S102
Additionally record
S103
Ejected?
Yes
No
No
S104
Instruction to perform border close from host?
Yes
S112
Record border out (0.1mm)
S113a
Record lead-in or border-in one before
No
S114
First border close after additional recording in L1 layer?
Yes
S115
Record short middle area (0.25 mm) into L0 layer and L1 layer
S116
Finalize?
No
Yes
S117
Record normal middle area
S118
Record lead-out area
End

[FIG. 13]


Blank disc
Data area
L1
L0
Start data additional recording
S102-1
S102-2
Border close process
LI
BO
S113a
S112
101-0
105c-0
About 0.1mm
Restart additional recording
S102-5
S102-3
S102-4
Border close process
About 0.1mm
105c-1
About 0.25mm
104s-1
S115-2
SMA
BI
105b-0
S115-1
104s-0
Finalize process
0.5mm or more
103-1
S118
LO
MA
S117-2
S117-1
104-1
104-0

[FIG. 14]


Blank disc
Data area
L1
L0
Start data additional recording
S102-5
S102-3
S102-4
Border close process
About 0.1mm
105c-1
S112
About 0.25mm
104s-1
S115-2
BO
SMA
LI
S115-1
104s-0
About 0.25mm
Finalize process
About 0.1mm
105c-1
0.5mm or more
S118
About 0.25mm
104s-1
0.5mm or more
104-1
S117-2
LO
MA
S117-1
104s-0
About 0.25mm
104-0
0.5mm or more